who made bacteriological examinations of one hundred and fifty-seven samples of water from apparently unpolluted sources, and of fifty from obviously polluted sources, paying special attention to what appears to be the most important point in connection with the sanitary significance of the results of such examinations, namely, the approximate number of the organisms found. The samples were collected in 100-c.c. sterilized bottles, and in every case reached the laboratory within three or four hours. Only those organisms which gave the following reactions were regarded as colon bacilli: Fermentation of dextrose broth with production of gas in twenty-four hours; fermentation of lactose in the litmus-lactose-agar plate, with distinct reddening in twenty-four hours; production in twenty-four hours of sufficient acid in milk to cause coagulation on heating; production of nitrites from nitrates in twenty-four hours; production of indol in peptone solution in three days (all the above at 37° C.); and formation of the typical gelatin stab-growth of B. coli without liquefaction of the gelatin in seven days. Some of the organisms which resembled the colon bacillus, except in one or two characteristics, usually the power to reduce nitrates or to form indol, were classed as paracolon organisms—true colon bacilli which have lost certain functions by sojourn in an unfavorable environment. Certain organisms which produced acid, but no gas, in the dextrose tube; which coagulated milk; which failed to form indol or to reduce nitrates; and which grew best under anaërobic conditions and but feebly in media not containing sugar, were examined sometimes in more detail and were found to belong to the group of streptococci and staphylococci, regarded by Houston as characteristic of sewage. The authors conclude, as to methods of analysis, that the use of large samples in applying the colon test to the sanitary analysis of drinking water is not advantageous, for waters of good quality are more likely to be condemned, and, on the other hand, the loss of a considerable proportion of colon bacilli during incubation of large samples may cause bad waters to appear to better advantage. They suggest, also, a number of modifications in the routine process.

Single c.c. examinations of the one hundred and fifty-seven samples from apparently unpolluted sources revealed the colon bacillus but five times, the paracolon organisms also five times, and streptococci three times; but when 100 c.c. were employed, the same organisms were detected, respectively, eleven, five, and ten times. Single c.c. examinations of the fifty samples from obviously polluted sources showed the colon bacillus in thirteen, the paracolon group in six, and streptococci in twenty-five; and 100 c.c. samples yielded but four positive results as to the colon bacillus and twenty-two as to streptococci.

Infection through Droplets and Dust.—Attention is called by B. HEYMANN (*Zeitschrift für Hygiene und Infectionskrankheiten*, xxxviii. p. 21) to the fact that Koeniger, Kirstein, Hutchinson, and others, who have studied the subject of infection through droplets expelled from the air-passages through sneezing, coughing, and speaking, have not employed the bacillus of tuberculosis in their experiments, but have made use of other bacteria. In a series of experiments conducted by himself, he made use of a glass cabinet of three cubic metres' capacity, in which coughing consumptives were confined up to one and a half hours. Dishes and plates were placed in different situations within the cabinet, for the purpose of catching the expelled droplets, and at the end of each exposure these were rinsed out and rubbed with a small amount of broth, which was then injected into the peritoneal cavity of guinea-pigs, which, after ten or twelve weeks, indicated by their condition whether or not virulent bacilli had been thrown out. He demonstrated that some individuals produce at times, not only in front but on all sides, a mist of droplets containing living germs. The majority of these droplets are large and settle quickly, but some are very small and are projected more than a metre, and remain in suspension sometimes more than an hour. These results demonstrate the importance of holding a handkerchief before the mouth while coughing. The duration of life of the bacilli within the droplets was determined as eighteen days when protected from light, and three days when exposed thereto. A second series of observations concerning the formation and movement of tuberculous dust from dried deposits on carpets, floor-boards, and handkerchiefs showed that the last-mentioned objects are more causative of danger than the others, since when they are rubbed or waved they give off a very fine dust which remains a long time in suspension, while that stirred up from the carpets and floor-boards through ordinary mechanical means is sent but a short distance into the air, and soon settles back. He concludes that dust is considerably less dangerous as a carrier of infection than droplets.

The subject of penetration of bacteria into the lungs through inhalation of droplets and dust has been investigated by OSCAR NENNINGER (*Ibid.*, p. 94), who found that, whereas very small numbers of bacteria are almost always present in the air-passages and lungs removed with all care from animals (sheep, swine, and rabbits) immediately after slaughter, numerous colonies of B. prodigiosus were present in all parts of the lungs of guinea-pigs and rabbits exposed for ten minutes to the spray of a culture of that organism and then immediately killed. The same result was observed when a culture was smeared on the buccal mucous membrane and the animal was forced to breathe through the mouth by closure of the nostrils. Dust containing spores of B. megatherium reached even the finest branches of the air-passages, but the number of organisms found was materially smaller than was observed when droplets were inhaled, manifestly because dust particles require greater rapidity of movement of the air for their convection, and because they are more easily caught and detained by the mucous membrane. Owing to the normal bactericidal action of the tissues, infection follows seeding with pathogenic germs only when local conditions are favorable thereto.

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